



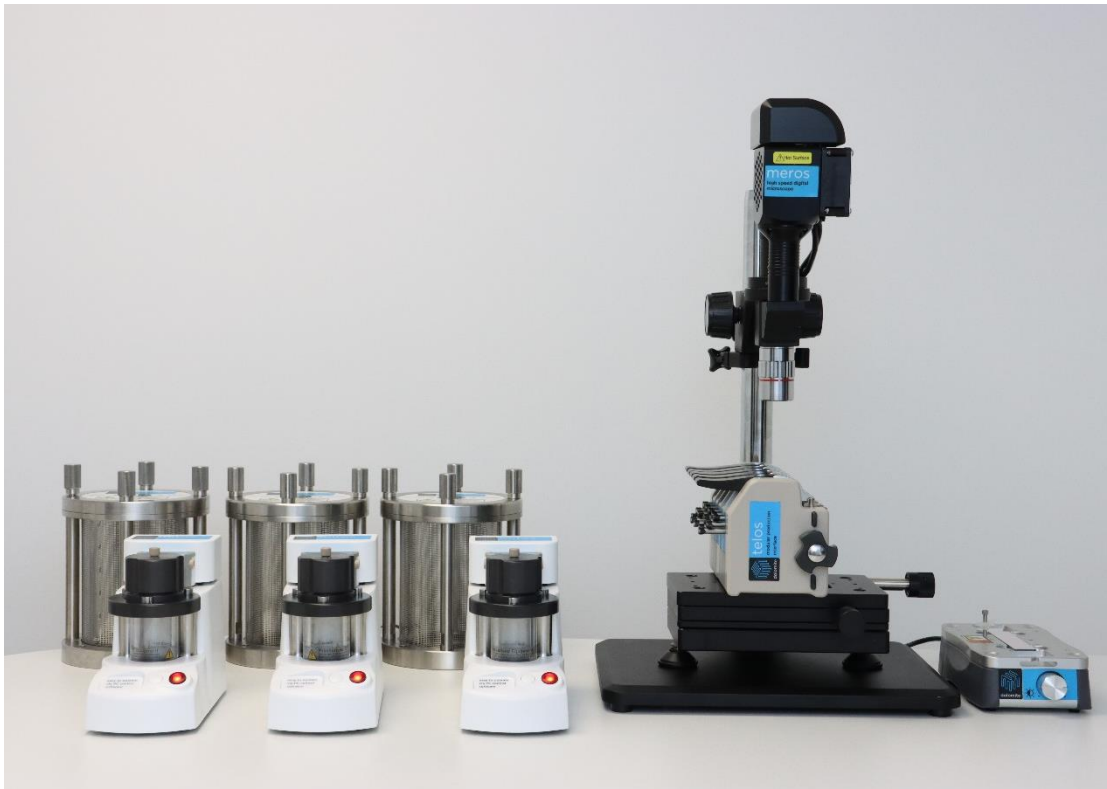
## 3201106 - Dolomite Telos System

### Product Datasheet

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# 1 Disclaimer

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## 2 Description

The Telos System (3201106) is a breakthrough product for parallel microfluidic processes, including emulsion generation, micro-particle production, high throughput mixing and microreactions. This modular, scalable, and highly flexible system removes the low throughput limitation of individual microfluidic chips, enabling litres of droplets or particles to be produced in a day.

The Telos System provides a pulseless and stable liquid flow, with a wide pressure range of 0 – 10bar. The pressure driven pumps enable precise control over flowrates and droplet size, providing a highly advanced and flexible solution for droplet formation. In addition, quick changes to flow conditions using user-friendly control software enable fast optimization of droplet parameters.

Up to 10 Telos modules can be assembled in parallel. Each module holds a microfluidic chip typically with 7 junctions, enabling a total of 70 parallel junctions to be run at once. All junctions are visible from above and below for illumination and optical access. The modules also have integrated valves providing excellent flow control during priming and operation and optional integrated filters on all input streams.

*Note: Illustration on the front page show the Dolomite Telos System along with the Dolomite Imaging Pack (3201107), which is optional but highly recommended, enabling real-time imaging and capture of high-throughput emulsion formation.*

## 3 Applications and Compatible Microfluidic Chips

Telos benefits a wide range of industries including pharmaceutical, food, agrochemical, cosmetics and research and can be used for numerous applications:

- High throughput emulsion and foam generation
- Microparticle and nanoparticle synthesis
- Novel product formulation
- DNA, cell and bead encapsulation

The following microfluidic chips are compatible with the Dolomite Telos System and are available for purchase. Up to 10 chips can be used in tandem, with each chip requiring **a Chip Clamp Module (3200662)**.

Part Number	Microfluidic Chips
3200664	Telos 2 Reagent Chip Surface Connection (100 µm etch depth), Hydrophilic
3200665	Telos 2 Reagent Chip Surface Connection (100 µm etch depth), Hydrophobic
3200666	Telos 2 Reagent Chip Surface Connection (100 µm etch depth), Fluorophilic
3200667	Telos 2 Reagent Encapsulation Chip Surface Connection (50 µm etch depth), Fluorophilic
3200668	Telos 2 Reagent Chip Surface Connection (50 µm etch depth), Hydrophilic
3200669	Telos 2 Reagent Chip Surface Connection (50 µm etch depth), Hydrophobic
3200670	Telos 2 Reagent Chip Surface Connection (50 µm etch depth), Fluorophilic
3200671	Telos 2 Reagent Encapsulation Chip Surface Connection (50 µm etch depth), Hydrophilic
3200672	Telos 2 Reagent Encapsulation Chip Surface Connection (50 µm etch depth), Hydrophobic
3200816	Telos 2 Reagent Encapsulation Chip Surface Connection (30 µm etch depth), Hydrophilic
3200817	Telos 2 Reagent Encapsulation Chip Surface Connection (30 µm etch depth), Hydrophobic
3200818	Telos 2 Reagent Encapsulation Chip Surface Connection (30 µm etch depth), Fluorophilic
3200819	Telos 1 Reagent 3D Flow Focusing Chip Surface Connection (100 µm etch depth), Hydrophilic
3200821	Telos 1 Reagent 3D Flow Focusing Chip Surface Connection (100 µm etch depth), Fluorophilic
3200832	Telos Micromixer Chip Surface Connection, Hydrophilic
3200833	Telos Micromixer Chip Surface Connection, Hydrophobic

## 4 System Components

The Telos System is supplied with:

- 3 x P-Pumps
- 3 x Sensor Interface
- 2 x Mitos Flow Rate Sensor (0.2-5ml/min)
- 2 x Mitos Flow Rate Sensor (30-1000ul/min)
- 3 x Remote Chambers (400 mL)
- 1 x Telos Support Frame
- 1 x Telos Tubing Pack
- 1 x System Controller PC
- 1 x USB Hub
- 1 x Plug for 1.6mm (10 Pack)
- 1 x Plugs for 1/4 - 28 Ports (pack of 6)
- 1 x End Fittings and Ferrules for 1.6mm Tubing (pack of 10)
- 1 x Pneumatic Connector Kit
- 3 x 2-way In-line Valve
- 1 x Ferrule with Integrated Filter (pack of 10)
- 3 x Fluid Tube (1/16") to Pneumatic Tube (6mm)
- 2 x Telos Valve Block
- 1 x Telos Plug Set
- 1 x Telos Purging Chip (Pack of 5)
- 1 x 10µm PEEK B-o-B Filter (Pack of 5)
- 1 x Telos Starter Kit SC
- 1 x Headless Nut and Ferrule PEEK 10-32 (pack of 10)
- 3 x Top Interface 1-way (4mm)
- 3 x Microscope Light Reflector (15mm x 4mm)
- 1 x Pressure Isolation/Dump Valve
- 1 x Tubing Clip (5 pc)
- 1 x Telos Spares Pack (FFKM)
- 1 x T Connector (PEEK)
- 1 x Telos Spares Pack (FKM)

The Dolomite Imaging Pack (containing a High-Speed Digital Microscope; Part No. 3201107) and region-specific compressors can be purchased alongside the Telos System.

## 5 Benefits

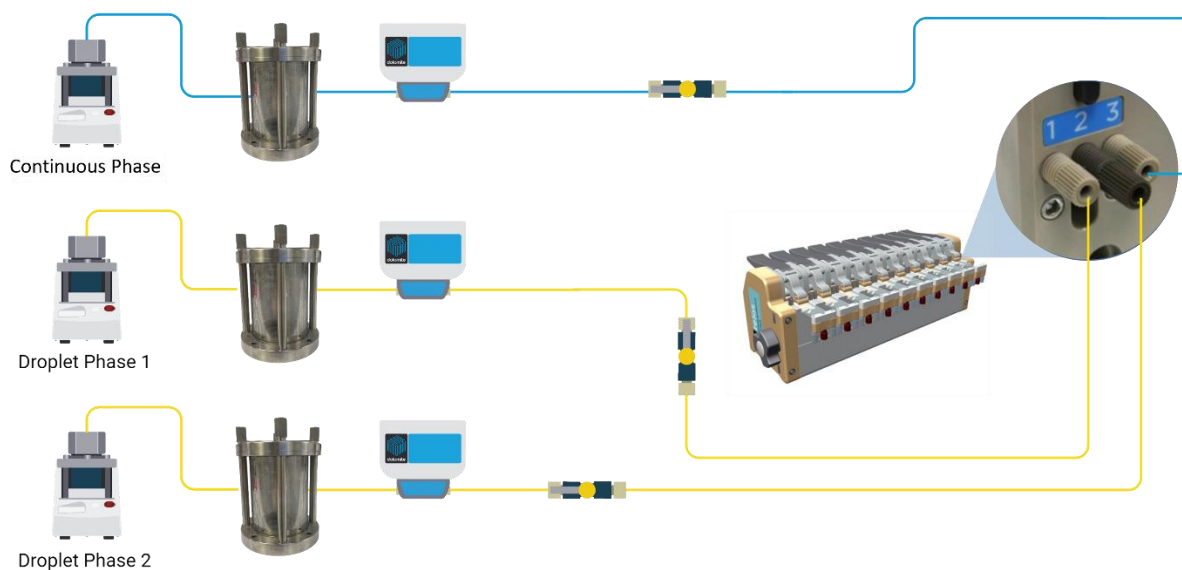
- Monodisperse droplets, with precisely controlled and reproducible droplet volumes
- Wide range of droplet/particle size and generation frequency
- High-throughput microfluidics
- Excellent flow control during priming and operation

- Scalable with up to 10 chips in parallel
- Versatile platform with application packs tailored for advance R&D
- Ease of use and reliability
- Chemically stable
- User friendly control software

## 6 System Specifications

<b>System Components</b>	3 x P-Pump, 3 x Sensor Interface, 3 x Remote Chamber, 4 x Flow Rate Sensors, System PC, Telos Support Frame, Calibrate Tubing Pack, Range of extra accessories listed in the components
<b>Operating Pressure</b>	0 - 10 bar
<b>Supply Pressure (PFS)</b>	> 1 Bar < 11 Bar
<b>Pump Type</b>	Pulseless Pressure Driven Pump
<b>Number of Chips in Parallel</b>	1 - 10
<b>Flow Rate Range</b>	30 µl/min to 5ml/min (Flow Rate Sensor dependent)
<b>Sample volume</b>	Max: 400 mL
<b>Dimensions (complete system)</b>	1014 mm (Max length) x 239 mm (W) x 200 mm (H)
<b>Intended use space requirements</b>	Recommended 200 cm (access is required to the rear and front of the system)
<b>System Weight</b>	29.75 Kg
<b>Voltage Input</b>	100 V – 240 V AC, 50 – 60 Hz
<b>Working Temperature Range (external)</b>	5 - 40 °C
<b>Maximum Relative Humidity</b>	80 %
<b>Communication</b>	DB9 to USB via Dolomite Flow Control Center Software
<b>Wetted Material</b>	Glass, FEP (tubing), FFKM, FKM, PEEK and PTFE
<b>Tubing Dimensions</b>	1/16" OD x 0.8 mm ID

## 7 Typical System Setup



## 8 P-Pump

The P-Pump (Part No. 3200175) provides pulseless liquid flow with a precise pressure driven pumping mechanism. It operates over a wide pressure range (0 – 10 bar) with excellent response time and accuracy. The design features a lockable pressure chamber for safety, which is easy to access and accommodates a wide range of fluid vessels. The User controls the P-Pump via the Dolomite Flow Control Centre software that comes pre-loaded on the system PC. Pressure driven flow is ideal for microfluidic systems where highly stable flow is required in the nL/min to  $\mu\text{L}/\text{min}$  range for applications such as droplet formation.

### 8.1 Features and benefits:



- Pulseless pumping performance
- Fast response time
- Wide pressure (0 - 10 bar) range enabling use with systems of high fluidic resistance
- Accommodates a wide range of fluid vessels (standard and non-standard)
- Quick and easy to set-up and run, with intuitive control
- Works with laboratory  $\text{N}_2$  or Ar supply, gas bottle or compressor
- Uses samples direct from your container – no mess and no waste
- Closed-loop flow control option (with MitoS Flow Rate Sensor in-line)

### 8.2 Specifications

<b>Weight</b>	2 Kg
<b>Ampere</b>	1 A

<b>Voltage</b>	100 V – 240 V AC
<b>Operating Temperature</b>	5 - 40 °C
<b>Operating Humidity</b>	20 - 80%
<b>Dimensions</b>	239 mm (L) x 93 mm (W) x 146 mm (H)

## 9 Remote Chamber 400ml

The Remote Chamber 400ml (Part No. 3200043) enables greater input volumes up to 400 ml to be used with the Mitos P-Pump. Continuous pumping for long periods of time is therefore possible.

### 9.1 Features and Benefits

- Compatible with P-Pump (Part No. 3200175)
- Dimensions: 14.5cm (length) x 14.5cm (width) x 20cm (height)
- Supplied with 250 mL Duran Bottle
- Excellent chemical resistance



## 10 Sensor Interface

The Sensor Interface (Part No. 3200200) can be used interchangeable with the Mitos Flow Rate Sensors supplied within the system which simply attach with a push-click action. The Sensor Interface seamlessly connects a flow rate sensor to the P-Pump using a circular multi-pin interface cable, allowing users to switch from pressure control mode to flow control mode within the control software.

### 10.1 Features and Benefits



- Real-time display of flow rate with control software
- Easy to use, just connect to P-Pump
- Dimensions: 20.5 mm (length) x 82 mm (width) x 55 mm (height)
- Interchangeable flow rate sensors to provide wide range of flow rates
- Excellent chemical resistance

## 11 Flow Rate Sensor

Designed for use with the Sensor Interface (Part No. 3200200), the Flow Rate Sensors enable fast and accurate measurements of ultra-low liquid rates. The high precision thermal sensor technology provides total media isolation and extremely low internal volume with no moving parts. All measurement data is fully calibrated for water and temperature compensated by means of an internal microcontroller.



### 11.1 Features and Benefits

- Flow rate range: 30 - 1000 µL/min, 0.2 – 5 mL/min, accuracy within 5%
- Fast response time of 30 ms
- Low internal volume to minimise interference with fluid flow
- Inner diameter: 1000 µm, 1800 µm
- Maximum pressure: 10bar
- Overall size: 75mm (length) x 82mm (width) x 60mm (height)
- Compatible with P-Pump (Part No. 3200175)
- Wetted materials: PEEK, glass and PTFE



## 12 Telos Support Frame



The Telos Support Frame slots onto the ends of a series of Telos Clamp Modules (Supplied with Application Packs, Part No: 3200662) creating a system with up to 10 Telos Clamp Modules.

One end of the Telos Support Frame has fluid input ports which are fed by P-Pumps (Part No. 3200175). The Telos Support Frame has adjustable legs to set the height for vertical orientation of the chip output over a liquid collection reservoir.

### 12.1 Specifications

<b>Number of Ports</b>	3
<b>Operating Pressure</b>	10 bar*
<b>Operating temperature of connector</b>	4 to 50 °C
<b>Wetted Material</b>	FFKM (seals), FEP (tubing)

\* Tested at 21 °C

## 13 PC Specifications

<b>Weight</b>	PC: 0.649 Kg Screen: 2.9 Kg Keyboard: 0.50 Kg
<b>Ampere</b>	1 A
<b>Voltage</b>	100 V – 240 V AC
<b>Operating Temperature</b>	5 - 40 °C

<b>Operating Humidity</b>	20 - 80%
<b>Dimensions</b>	PC: 120 mm (L) x 110 mm (W) x 50 mm (H) Screen: 498 mm (L) x 164 mm (W) x 387 mm (H) Keyboard: 190 mm (L) x 140 mm (W) x 25 mm (H)